

## CLAIMS

1. A method for coding or decoding an image, comprising:  
providing global motion parameters associated with a current image frame;  
deriving local motion vectors from the global motion parameters for individual  
macroblocks in the current image frame;  
5 using the local motion vectors to identify reference blocks in a reference frame; and  
using the identified reference blocks to encode or decode the macroblocks in the  
current image frame.

2. A method according to claim 1 including:  
10 identifying four global motion vectors associated with corners of the current image  
frame; and  
generating the local motion vectors by interpolating the four global motion vectors to  
locations of the macroblocks in the current image frame.

15 3. A method according to claim 1 including deriving the local motion vectors  
from the global motion parameters as follows:

$$\underline{v}(x, y) = \underline{r}^0 + \left( \frac{x}{H-4} \right) \underline{r}^x + \left( \frac{y}{V-4} \right) \underline{r}^y + \left( \frac{x}{H-4} \right) \left( \frac{y}{V-4} \right) \underline{r}^{xy} \quad (1)$$

where  $\underline{v}^{00}$ ,  $\underline{v}^{H0}$ ,  $\underline{v}^{0V}$ , and  $\underline{v}^{HV}$  represent the global motion parameters at four corners of  
the current image frame, (0,0), (H-4, 0), (0, V-4), and (H-4, V-4), respectively; x and y  
20 represent an upper-left pixel location for the macroblock; and  $\underline{r}^0$ ,  $\underline{r}^x$ ,  $\underline{r}^y$ , and  $\underline{r}^{xy}$  are the  
following:

$$\underline{r}^0 = \underline{v}^{00}$$

$$\underline{r}^x = \underline{v}^{H0} - \underline{v}^{00}$$

$$\underline{r}^y = \underline{v}^{0V} - \underline{v}^{00}$$

$$\underline{r}^{xy} = \underline{v}^{00} - \underline{v}^{H0} - \underline{v}^{0V} + \underline{v}^{HV}$$

5           4.       A method according to claim 1 including generating codewords that identify the macroblocks that use the global motion parameters to generate associated local motion vectors.

10           5.       A method according to claim 1 including:  
using the derived local motion vectors to identify reference blocks in the reference frame that are substantially the same as the macroblocks in the current image frame; and  
encoding the macroblocks as copy type macroblocks that are decoded by copying the identified reference blocks into the macroblocks.

15           6.       A method according to claim 5 including:  
identifying residuals between the reference blocks and the macroblocks; and  
encoding only the residuals for the macroblocks.

20           7.       A method according to claim 1 including:  
receiving an encoded bit stream including macroblocks identified as global motion vector coded and either copy type or residual type;  
deriving local motion vectors only for the global motion vector coded macroblocks;  
using the derived local motion vectors to identify reference blocks in the reference frame;

copying the identified reference blocks for the copy type macroblocks; and  
adding encoded residuals to the identified reference blocks for the residual type  
macroblocks.

5           8.       A method according to claim 1 including:  
  
              encoding and decoding some of the macroblocks in the current image frame using  
global motion vector coding where the global motion parameters are used to generate local  
motion vectors for the macroblocks; and  
  
              encoding and decoding other macroblocks in the current image frame using another  
10           coding scheme.

              9.       A method according to claim 1 including:  
  
              generating subblock local motion vectors for individual subblocks in the same  
macroblocks using the global motion parameters;  
  
              15           identifying individual reference subblocks in the reference frame pointed to by the  
subblock local motion vectors; and  
  
              separately encoding and decoding the subblocks using the identified reference  
subblocks.

20           10.       A decoder, comprising:  
  
              a processor decoding encoded image frames by deriving local motion vectors for  
identified macroblocks, the local motion vectors derived from global motion estimation  
parameters associated with the image frames, the processor using the local motion vectors to

identify reference blocks in a current reference frame and then using the reference blocks to reconstruct the macroblocks in a current frame.

11. A decoder according to claim 10 wherein the processor generates the local  
5 motion vectors by interpolating the global motion estimation parameters to locations of the macroblocks in the current frame.

12. A decoder according to claim 10 wherein the processor detects code words  
10 included along with the encoded image frames that identify global motion vector coded macroblocks.

13. A decoder according to claim 12 wherein the code words indicate when the  
macroblocks are a direct copy of the reference blocks.

14. A decoder according to claim 12 wherein the code words indicate when  
15 residuals are added to the reference blocks to reconstruct the macroblocks.

15. A decoder according to claim 10 wherein the processor uses the global motion  
estimation parameters to generate local motion vectors for different subblocks, the processor  
20 using the local motion vectors to identify different reference subblocks in the current reference frame and then using the identified reference subblocks to reconstruct the subblocks in the current frame.

16. An encoder, comprising:

a processor encoding an image frame by encoding a set of global motion estimation parameters for an image frame and identifying macroblocks in the image frame that have local motion estimation parameters derived during decoding from the global motion estimation parameters.

17. An encoder according to claim 16 wherein the global motion estimation parameters include global motion vectors associated with corners of the image frame.

18. An encoder according to claim 17 wherein the processor compares the global motion estimation parameters with block motion estimation parameters to determine which macroblocks use the local motion estimation parameters derived from the global motion estimation parameters.

19. An encoder according to claim 16 wherein the processor generates codewords that identify the macroblocks that derive the local motion estimation parameters from the global motion estimation parameters.

20. An encoder according to claim 16 wherein the processor identifies macroblocks that are directly copied from reference blocks pointed to by the local motion estimation parameters derived from the global motion estimation parameters.

21. An encoder according to claim 16 wherein the processor encodes residuals for the identified macroblocks but no local motion estimation parameters.

22. An encoder according to claim 16 wherein the processor performs run length coding on the encoded image frame.

23. An encoder according to claim 16 wherein the macroblocks are  $N \times N$  pixel arrays, where  $N$  is an integer; the subblocks are  $M \times M$  pixel arrays, where  $M$  is an integer less than or equal to  $N$ .

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